

Chapter 5.5

Ergonomics

This could be you . . .

A supervisor began having pain in his wrist when using his computer. He took the Computer Ergonomics class, followed the suggestions made in the class, and has been pain-free ever since.

An employee began having neck pain after moving into a smaller office. An ergonomic assessment showed that her neck pain was due to twisting, which was caused by her computer monitor not being lined up with the keyboard or her body.

1. Applicability of this chapter

You are required to follow this chapter if you work at JSC or a JSC field site.

2. What this chapter covers

This chapter covers JSC's ergonomics program. Although there is currently no OSHA ergonomics standard, JSC is committed to eliminating injuries and illnesses caused by improper ergonomics.

3. Why ergonomics is important

Ergonomics is the science of fitting jobs to people. Ergonomic design is applying this body of knowledge about physical abilities, limitations, and other human characteristics to the design of the workplace (i.e., work tasks, equipment, environment) for safe and efficient use by workers. It is principally based on preventing musculoskeletal disorders (MSDs) such as carpal tunnel syndrome, back injuries, and other work-related disorders caused by improper job, tool, and workstation design. MSDs account for an increasingly large percentage of worker's compensation costs, and they represent nearly half of the occupational illnesses reported in the annual Bureau of Labor Statistics survey.

4. Elements of a complete ergonomics program

A full "ergonomics" program consists of five program elements:

- a. **Management leadership**, as demonstrated by an effective MSD reporting system, prompt responses to reports, clear program responsibilities, and regular communication with employees about the program.
- b. **Employee participation**, as demonstrated by early reporting of MSDs and active involvement by employees and their representatives in the implementation, evaluation, and future development of the ergonomics program.

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- c. ***Job hazard analysis and control***, as demonstrated by a process that identifies, analyzes, and uses feasible engineering, work practice, and administrative controls to control MSD hazards or to reduce MSD hazards to the extent feasible, and that evaluates controls to ensure that these measures are effective.
- d. ***Training*** of managers, supervisors, and employees in the ergonomics program and their role in it, the identification of MSD hazards in jobs, and the methods to control them.
- e. ***Ergonomics program evaluation***, as demonstrated by regular reviews of the elements of the program and of the effectiveness of the program as a whole, using such measures as reducing the number and severity of MSDs, increasing the number of jobs in which MSD hazards have been controlled or reducing the number of jobs posing MSD hazards, and correcting identified deficiencies in the program.

5. Who needs to be involved in JSC's ergonomic program

- a. If you are a ***manager***, you need to be committed to eliminating ergonomic hazards as part of your commitment to maintaining a safe and healthful workplace. Once a problem has been found, take all actions necessary to fix it within the bounds of operational requirements and budget. You shall:
 - 1. Assign a person to track ergonomic concerns and solutions in your area, if applicable. Ergonomic evaluation teams may also be necessary for your area.
 - 2. Ensure that your policies and practices encourage and do not discourage early reporting of MSDs, their signs and symptoms, and MSD hazards; and employee participation in the ergonomics program.
 - 3. Communicate with employees about the effectiveness of the ergonomics program and their concerns.
 - 4. Refer employees suffering from MSD symptoms to the JSC Clinic for evaluation and medical follow-up.
 - 5. Ensure recommendations made during an employee ergonomic evaluation are implemented and are effective in solving the employee's concerns.
- b. As an employee, make the ergonomics program work for you by:
 - 1. Learning the signs and symptoms of MSDs and reporting any that you notice to your supervisor.
 - 2. Practicing good posture and work habits to reduce ergonomic injury.
 - 3. Bringing your ergonomic concerns to management.
 - 4. Attending training so that you may serve on an ergonomic evaluation team, learning and using skills to identify and analyze jobs for ergonomic hazards, and making recommendations to correct them.
 - 5. Practicing good ergonomics off the job.

6. How to know if you have ergonomic hazards

- a. Analyze your own job and workspace by using the checklist at:
<http://ks.jsc.nasa.gov/CBT/ergo/main.cfm>
- b. . If you have an area ergonomic team, you may contact it for an evaluation.
- c. Take the computer or occupational ergonomics course from the Clinic Services Branch or from your company. Use SATERN to register for these courses.
- d. Look for things that increase MSD risk:
 1. Frequency – The rate at which you repeat specific physical motions or exertions.
 2. Force – Physical exertion by or pressure applied to any part of the body.
 3. Duration – The length of any period of work activity that poses an MSD risk.
 4. Posture – The position of any part of your body during a work activity, especially awkward or static postures.
 5. Exposure to localized or whole-body vibration.
 6. Exposure of hands and feet to cold temperatures that cause discomfort.
- e. Go to the JSC Clinic to report any discomfort. They will notify the Occupational Health Department to perform an ergonomic evaluation of your workstation.

7. How to correct ergonomic hazards

JSC prefers to prevent ergonomic injuries by making changes to workstations and job procedures. The idea is to fit the job to the person; not to make the person fit the job. Specifically, you can:

- a. Change your computer workstation to fit your body correctly by:
 1. Placing your keyboard and monitor directly in front of you.
 2. Placing the keyboard close to your body and the mouse close to the keyboard.
 3. Adjusting your chair so your forearms are parallel to the floor when using a keyboard. Make sure the chair has firm back support.
 4. Using soft wrist rests at the keyboard and mouse.
 5. Placing your monitor screen so you see no glare, usually at a 90-degree angle to any window and not tilted. You may also adjust window shades or blinds to control glare.
 6. Placing your screen so the top line of type is at or slightly below eye level. Place your screen slightly lower than that if you wear bifocals.
 7. Using a document holder if you often type from hardcopies.
 8. Keeping yourself about 18 to 24 inches from your monitor. This is usually about arm's length. The larger the monitor, the farther away you should be.

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9. Cleaning your monitor weekly to prevent dust buildup on the screen.
 10. Setting up your laptop workstation by getting an external keyboard and mouse and adjusting your laptop monitor to the correct height. (NOTE: Placing your laptop on a docking station may cause the screen to be too high for viewing comfort.)
- b. Have your eyes checked if you are having eyestrain. Be sure to tell your optometrist if you work with a computer.
 - c. Check with your area Organization Administrative Representative to get furniture that fits your body size and space constraints. NOTE: Furniture (including chairs) will only be replaced when determined to be necessary by ergonomic evaluation and the Organization Administrative Representative (see paragraph 12 below).
 - d. Email jsc-logistics-wcc@nasa.gov for repair of any broken furniture.
 - e. Avoid awkward positions, repetitive motions, and excessive force in your job.
 - f. Adjust the lighting and noise levels to comfortable levels. Adjust the temperature to a comfortable level within indoor air quality requirements (Chapter 5.4 of this Handbook) and JSC Energy Conservation guidelines.
 - g. Select tools and handles that are comfortable and reduce strain and vibration in your hands and arms.
 - h. Make sure that the tools you use (including your keyboard and mouse) are in good working order and have been properly maintained.
 - i. Analyze the tasks you do. Try to find an easier or more comfortable way to get the job done.
 - j. For non-computer workstations such as soldering benches, microscopes, etc., contact the Occupational Health Department for an individual assessment.

8. Administrative controls for ergonomic hazards

Administrative controls reduce your exposure to ergonomic hazards. A person who has had an MSD will likely need more attention. As an employee or manager, you can:

- a. Reduce the number of repeated motions for each employee and limit overtime work.
- b. Allow yourself or your workers time to get used to a job.
- c. Take short rest breaks (1 to 3 minutes per hour) to relieve tired muscles and tendons.
- d. Increase the number of employees assigned to a task to lighten the load on everyone (especially in lifting heavy objects).
- e. Rotate jobs to reduce fatigue and stress on a particular muscle group.
- f. Provide standby or relief personnel to compensate for busy times on the job.
- g. Reduce repeated motions by combining quick jobs.

- h. Develop realistic goals and timelines. Try not to wait until the last minute to schedule a job.
- i. Exercise to improve physical fitness.

9. Training to reduce ergonomic hazards

Ergonomic training is an effective way to reduce ergonomic injuries. This training is recommended on initial assignment and at least every 3 years thereafter. If you are:

- a. A new employee or one that has been reassigned, initial orientation and hands-on training should include:
 - 1. Properly arranging your workstation.
 - 2. Caring for, using, and handling any equipment.
 - 3. Using special tools and devices associated with individual workstations.
 - 4. Using proper lifting techniques.
 - 5. Learning how to recognize MSD signs and symptoms.
 - 6. Learning how to report MSD signs and symptoms, and the importance of early reporting.
 - 7. Discovering your role in the JSC ergonomics program and in evaluating the effectiveness of ergonomic controls.
 - 8. Understanding the provisions of any applicable existing standards.
- b. A supervisor or manager, your training is similar to your employees' training and includes:
 - 1. Recognizing early signs and symptoms of MSDs and hazardous work practices.
 - 2. Effectively managing the ergonomic hazards in your areas of responsibility.
 - 3. Evaluating the effectiveness of the ergonomics program in your area.
- c. As plant engineer or maintenance person, your training should include how to prevent and correct ergonomic hazards through job and workstation design and proper maintenance.

10. Responsibility for the JSC ergonomics program

The Clinic Services Branch has responsibility for the formal ergonomics program. This office will help other organizations perform evaluations, develop job-specific programs, and train employees.

11. What to do if you have problems from ergonomic hazards

If you have concerns about ergonomic issues or hazards please follow the flowchart on the following page (figure 5.5-1) to start an investigation, do an evaluation, resolve a concern, or receive a medical evaluation. If you have any of the following symptoms of ergonomic hazards, report them to your supervisor and go to the JSC Occupational Medicine Clinic. Watch for persisting or recurring:

- a. Pain from exertion, pressure, or exposure to cold or vibration, except when the pain is due to an acute injury such as a burn, an abrasion, a splinter, a slip, or a fall.
- b. Skin color becoming blue, abnormally white, or red on exposure to cold or vibration.
- c. Numbness or tingling in an arm, a leg, a hand, or a foot.
- d. Decreased grip strength.
- e. Decreased range of joint movement.
- f. Swelling of a joint or part of an arm, a leg, or a digit.

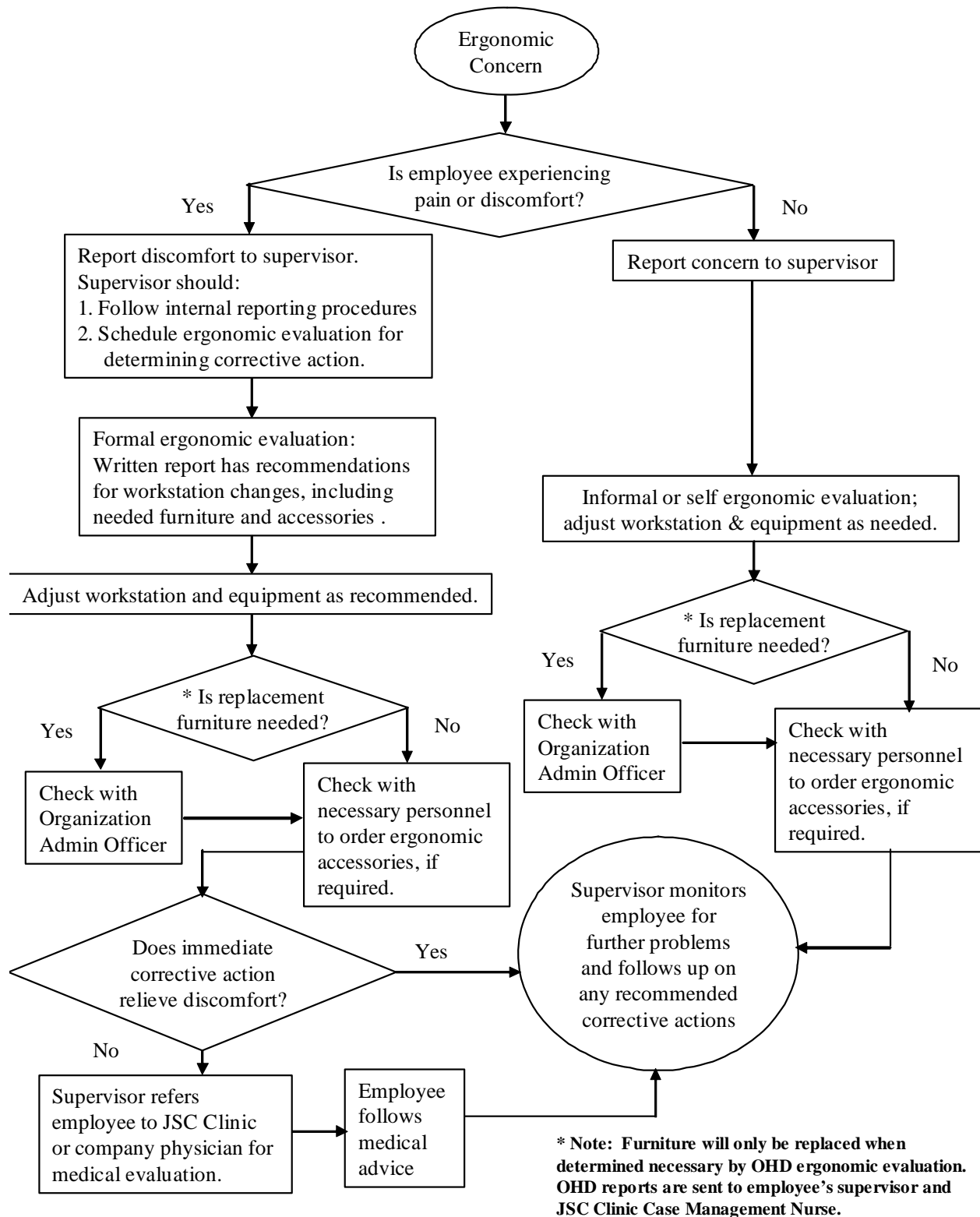


Figure 5.5-1: Flowchart for dealing with ergonomic concerns

12. Priorities for providing different furniture or accessories for computer workstations

Priorities for furniture are as follows:

- a. The JSC Furniture Department classifies furniture requests as follows:
 1. Class A – Employee is in pain and has reported this discomfort to the JSC Occupational Medicine Clinic, his or her company physician, or a private physician
 2. Class B – Employee is in pain but has not reported the discomfort to the JSC Occupational Medicine Clinic or a physician
 3. Class C – Employee does not have a chair or a desk
 4. Class D – Employee is currently experiencing no pain or discomfort
- b. Class A and B requests are filled first, followed by Class C. If supplies permit, Class D requests are filled.
- c. When the JSC Furniture Department inventory does not allow filling requests in a timely manner, contractors may provide chairs and other necessary furniture for their on-site employees. Clearly mark this furniture with the contractor's name to prevent confusion of ownership. The JSC Furniture Department will not support contractor-owned furniture for repair or replacement.
- d. The employee's management is responsible for providing ergonomic accessories, such as footrests, document holders, telephone headsets, trackballs, mouse rests or pads, ergonomic keyboards, and monitor risers.

13. Follow up on recommendations made during an ergonomic evaluation

Follow up on ergonomic evaluations is as follows:

- a. Your supervisor shall follow up to ensure that recommendations for arranging your workstation and changes in furniture were effective and have not caused additional discomfort.
- b. Case management personnel from the JSC Occupational Medicine Clinic or your employer may follow up on ergonomic evaluations due to pain or discomfort.
- c. You may be asked to fill out a follow-up worksheet.
- d. For furniture priorities Class A and B, if you do not receive your recommended furniture within 4 to 6 weeks, contact the center furniture personnel at JB9 for follow-up information.
- e. The Occupational Health Department will follow up when necessary at the request of employees, supervisors, or case managers.

14. For more information on ergonomics

Contact the Occupational Health Department 281-483-6726 if you desire more information on ergonomic hazards.